

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

see form PCT/ISA/220

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/ZA2004/000110

International filing date (day/month/year)  
17.09.2004

Priority date (day/month/year)  
13.10.2003

International Patent Classification (IPC) or both national classification and IPC  
F42D1/04, F42B39/30, B65H55/00

Applicant  
DETNET SOUTH AFRICA (PTY) LTD

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/ZA2004/000110

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/ZA2004/000110

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**Box No. IV Lack of unity of Invention**

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1. ☒ In response to the invitation (Form PCT/ISA206) to pay additional fees, the applicant has:
- ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☒ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
  - ☒ the parts relating to claims Nos. 1-16

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	1-16
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations

**see separate sheet**

**Re Item IV**

**Lack of unity of invention**

1. Reference is made to the following document:

D1: US2076512

2. This Authority considers that there are 3 inventions covered by the claims indicated as follows:

- I: Claims 1-16 directed to a detonator assembly;
- II: Claims 17, 18 directed to a method of forming a cable coil assembly;
- III: Claims 19, 20 directed to a method of installing a plurality of detonators in a respective plurality of boreholes in a daisy-chain configuration.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

3. The prior art has been identified as document D1 and discloses a detonator assembly which includes a first cable coil (5, *on the right of figure 5*) with first and second ends, a second cable coil (5, *on the left of figure 5*) with third and fourth ends, a detonator (1) connected to the first end of the first cable coil (5, *on the right of figure 5*), a first connector (9, *on the right of figure 4*) connected to the second end of the first cable coil (5, *on the right of figure 5*), and a second connector (9 *on the left of figure 4*) connected to the fourth end of the second cable coil (5, *on the left of figure 5*) and wherein a first variable length of cable, extending from the first end, can be drawn from the first cable coil (5, *on the right of figure 5*) without materially moving the first connector (9, *on the right of figure 4*) and a second variable length of cable, extending from the fourth end, can be drawn from the second cable coil (5, *on the left of figure 5*) without materially moving the first connector (9, *on the right of figure 4*)

The subject-matter of claim 1 differs from this known detonator assembly in that the first connector that is connected to the second end of the first cable coil is also

connected to the third end of the second cable coil.

It follows that the following technical feature of claim 1 makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

- first connector connected to the second end of the first cable coil and to the third end of the second cable coil.

The problem solved by this special technical feature can therefore be construed as avoiding that the two variable lengths of cable associated with each detonator of a detonator assembly become entangled with one another.

4. Document D1 does not disclose any method of forming a cable coil assembly.

It follows that all the technical features of claim 17 make a contribution over the prior art and can be considered as special technical features within the meaning of Rule 13.2 PCT, i.e.:

- drawing cable from a supply source and winding a single coil of a first predetermined length around a first former;
- severing the cable so that the single coil is separated at a first end from the supply source;
- forming a first cable coil by winding cable, of a second predetermined length which is shorter than the first length, drawn from the single coil, commencing at the first end, around a second former;
- simultaneously forming a second cable coil of a length which is substantially equal to the difference between the first and second lengths.

The problem solved by those special technical features can therefore be construed as providing a method of forming a cable coil assembly.

5. Document D1 discloses a method of installing a plurality of detonators in a respective plurality of boreholes in a daisy-chain configuration which includes the steps, for each

borehole, of drawing a first length of cable from a first cable coil (5, *cf. on the right of figure 5*) in confinement structure (*cf. "closed packet" of column 2, lines 27-37*), positioning a first detonator (1) which is connected to a first end of the first length of cable at a predetermined depth inside the respective borehole, drawing a second length of cable from a second cable coil (5, *cf. on the left of figure 5*) inside the confinement structure.

The subject-matter of claim 19 differs from this known method in that it comprises the step of connecting a first connector which is at a junction of the first and second coils, at the confinement structure, to a second connector which is at an end of a respective second length of cable associated with a first borehole.

It follows that the following technical feature of claim 19 makes a contribution over the prior art and can be considered as a special technical feature within the meaning of Rule 13.2 PCT:

- connecting a first connector which is at a junction of the first and second coils, at the confinement structure, to a second connector which is at an end of a respective second length of cable associated with a first borehole.

The problem solved by this special technical feature can therefore be construed as facilitating the use of automated manufacturing and testing processes, which allows for handling and transport.

6. Also, examining the possible correspondence by technical effect, one finds that:
  - the technical effect of the first invention is a good physical separation of the two cables associated with each detonator;
  - the technical effect of the second invention is a well formed cable coil assembly;
  - the technical effect of the third invention is a good confinement of both connectors and an easy retrieval of the second connector from the confinement structure.

This appears to show lack of corresponding technical effect as well. Consequently,

neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

7. In conclusion, the groups of claims are not linked by common or corresponding special technical features and define 3 different inventions not linked by a single general inventive concept. The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. The application does not meet the requirements of Article 6 PCT, because claims 1 and 16 are not clear.

Although claims 1 and 16 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

2. As already mentioned in point 3 of item IV, the document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

a detonator assembly which includes a first cable coil (5, *on the right of figure 5*) with first and second ends, a second cable coil (5, *on the left of figure 5*) with third and fourth ends, a detonator (1) connected to the first end of the first cable coil (5, *on the*

*right of figure 5), a first connector (9, on the right of figure 4) connected to the second end of the first cable coil (5, on the right of figure 5), and a second connector (9 on the left of figure 4) connected to the fourth end of the second cable coil (5, on the left of figure 5) and wherein a first variable length of cable, extending from the first end, can be drawn from the first cable coil (5, on the right of figure 5) without materially moving the first connector (9, on the right of figure 4) and a second variable length of cable, extending from the fourth end, can be drawn from the second cable coil (5, on the left of figure 5) without materially moving the first connector (9, on the right of figure 4).*

The subject-matter of claim 1 differs from this known detonator assembly in that the first connector that is connected to the second end of the first cable coil is also connected to the third end of the second cable coil.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as avoiding the two variable lengths of cable associated with each detonator of a detonator assembly to become entangled with one another.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: None of the documents cited in the search report discloses or suggests the differentiating feature of claim 1.

Remark: The above-mentioned lack of clarity notwithstanding, independent claim 16 also meets the requirements of the PCT with respect to novelty and inventive step.

3. Claims 2-15 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.